

User's Guide To The STATSGO Soils Browser

INTRODUCTION

The State Soil Geographic Database (STATSGO) Browser is a menu-based tool that provides access to the Natural Resource Conservation Service's (NRCS) STATSGO soils database and associated mapping units. This tool uses Arc/Info software to map and organize features of the database for all 50 states and Puerto Rico. The Browser, written in the Arc macro language (AML), takes advantage of Arc/Info's menu and display capabilities to map and graph geographic summaries of queries to STATSGO.

WHAT IS STATSGO

NRCS has established three geographic databases representing soil maps and related variables compiled at different scales. Table 1 summarizes the primary uses, scales, and sources for each of the three databases. Each map unit is linked to attribute data files containing soil properties and interpretive information. The NRCS Soil Interpretations Record database is the attribute data for each database (USDA, 1994).

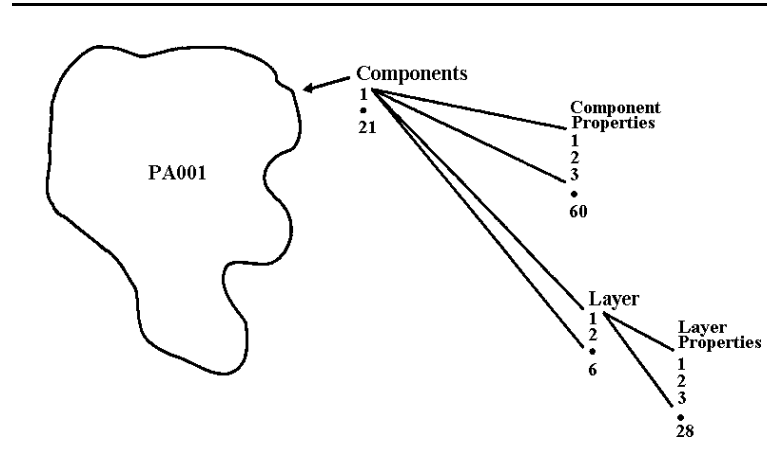
| SOIL DATABASE | PRIMARY USE | SCALE | SOURCE |
|---|--|-------------------------|--|
| SSURGO - Soil Survey Geographic | Farm, landowner, and county natural resource planning and management. | 1:12,000 to 1:63,360 | Field methods |
| STATSGO - State Soil Geographic | Regional, State, river basin, and multi-county resource planning, monitoring and management. | 1:250,000 | Generalized from more detailed soil survey maps, transects, LANDSAT images |
| NATSGO - National Soil Geographic | National and regional appraisal, planning, and monitoring | 1:5,000,000 | 1982 National Resources Inventory |

Table 1. NRCS Soil Geographic Databases

STATSGO was compiled for each state and designed primarily for regional, multi-state, river basin, state and multi-county resource planning, management, and monitoring. STATSGO data are not sufficiently detailed to make interpretations at the county level. In most areas, STATSGO maps were compiled by generalizing more detailed SSURGO maps. Where more detailed soil survey maps were not available, data on geology, topography, vegetation, and climate were assembled, together with Land Remote Sensing Satellite (LANDSAT) images. Soils of like areas were studied, and probable classification and extent of soils was determined. STATSGO map units are combinations of areas on the more detailed soils maps. Attributes of STATSGO map units are statistical summaries of attributes from all the component soils used to characterize

an entire map unit. Consequently, each map unit can have multiple components (maximum of 21) and each component can have multiple layers (maximum of six), Fig. 1. The soils component attribute table maintains 60 variables for each soil component. The layer table maintains 28

Figure 1 STATSGO map unit



variables for each soil component layer (USDA, 1994). In addition to the soil tables (component and layer), STATSGO contains ten interpretive data tables and three lookup tables for use with the spatial database. Figure 2 lists the variables found in each of the 13 STATSGO data tables available from the Browser.

THE NEED FOR A STATSGO BROWSER

STATSGO includes a complex variety of soil and soil-related data on a state-wide basis. The challenge in creating a tool to access this database was to make access efficient and easy-to-use within the constraints of the database design. The STATSGO multiple component and layer structure of the database makes it's use with GIS complex. The structure of STATSGO requires linking map units and attribute tables through a many-to-many-to-many relationship. That is:

- There are many non-contiguous polygons in each STATSGO map unit. Texas, for example, has map units with as many as 45 discrete polygons, and one map unit in Alaska has 90 polygons.
- Individual state component tables are related to map units by map unit identifiers (MUID). There are many (up to 21) soil components for each map unit.
- The layer table is related to the component table by unique component identifiers made up of MUIDs and sequence numbers (SEQNUM). Sequence numbers represent soil layers in each component. There are many (up to 6) soil layers for each soil component.

Figure 2. STATSGO Browser Attribute Schema

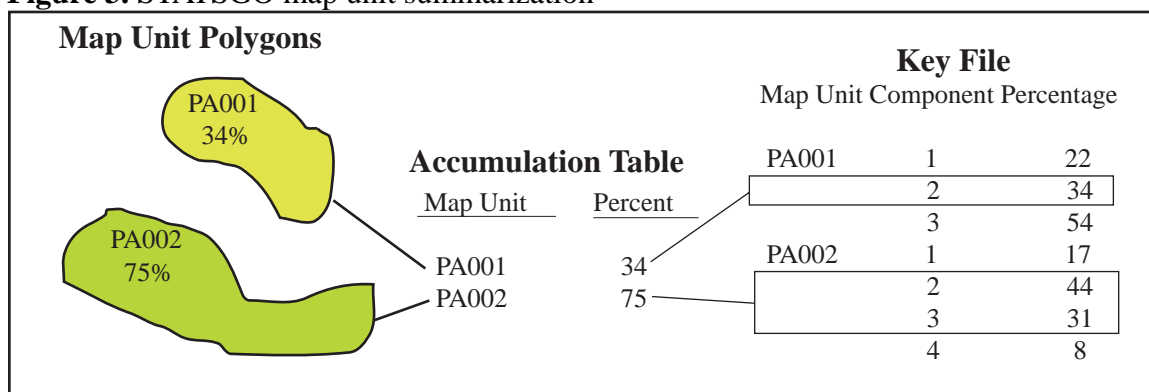
| | | |
|------------------------------|---------------------------------|--------------------------------|
| MAP UNIT | LAYER | FOREST |
| 1 Mapunit ID | 1 % 3-10 inches (WEIGHT)* | 1 Plant Symbol |
| 2 MLRA | 2 % > 10 Inches (WEIGHT)* | 2 Scientific Plant Name |
| | 3 % Passing Sieve No. 10* | 3 Common Plant Name |
| PHASE | 4 % Passing Sieve No. 200* | 4 Plant Ground Cover |
| 1 Component Kind | 5 % Passing Sieve No. 4* | |
| 2 Component Name | 6 % Passing Sieve No. 40* | WOODLAND |
| 3 Component Percent | 7 AASHTO Group Class | 1 Woodland Tree Suitability |
| 4 Flood Begin Month | 8 AASHTO Group Index | 2 Plant Symbol |
| 5 Flood Duration | 9 Available Water Capacity* | 3 Scientific Plant Name |
| 6 Flood End Month | 10 Bulk Density* | 4 Common Plant Name |
| 7 Flood Frequency | 11 Carbonate as CaCO3* | 5 Site Index |
| 8 Hydric Soils | 12 Cation Exchange Capacity* | 6 Production Class |
| 9 Irr. Capa. Subclass | 13 Clay* | |
| 10 Irr. Capability Class | 14 Gypsum* | WOODLAND MANAGEMENT |
| 11 Non-Irr. Capa. Subclass | 15 Layer Depth* | 1 Ordination Symbol |
| 12 Non-Irr. Capability Class | 16 Layer Number | 2 Woodland Erosion |
| 13 Prime Farm Lands | 17 Liquid Limit* | 3 Woodland Equipment |
| 14 Slope* | 18 Organic Matter* | 4 Seeding Mortality |
| 15 Surface Texture | 19 Permeability Rate* | 5 Windthrow Hazard |
| | 20 Plasticity Index* | 6 Plant Competition |
| COMPONENT | 21 Salinity* | |
| 1 Bedrock Hardness | 22 Sand | RANGE SITE PRODUCTION |
| 2 Cemented Pan Thickness | 23 Shrink/Swell | 1 Range site ID |
| 3 Corrosion Concrete | 24 Silt | 2 Range site Name |
| 4 Corrosion Steel | 25 Sodium Absorption Ratio* | 3 Production - Favorable |
| 5 Depth to Bedrock* | 26 Soil Erodibility; rock free* | 4 Production - Normal |
| 6 Depth to Cemented Pan* | 27 Soil Erodibility Factor* | 5 Production - Unfavorable |
| 7 Hydrologic Group | 28 Soil Reaction (pH)* | |
| 8 Initial Subsidence* | 29 USLE Tolerance (T) Factor | WIND BREAKS |
| 9 Ponding Begin | 30 Unified Soil Class | 1 Plant Symbol |
| 10 Ponding Depth* | 31 Wind Erodibility Group | 2 Scientific Plant Name |
| 11 Ponding Duration | | 3 Common Plant Name |
| 12 Ponding End | INTERPRETATION | 4 Windbreak Tree Height |
| 13 Potential Frost Action | 1 Interpretative Group Code | |
| 14 Soil Drainage Class | 2 Soil Interpret. Rating | WILDLIFE HABITAT |
| 15 Taxonomic Class | 3 Rating Limitation | 1 Grain Suitability |
| 16 Taxonomic Class Code | | 2 Grass Suitability |
| 17 Taxonomic Great Group | COMPONENT YIELD | 3 Herbaceous Plant Suitability |
| 18 Taxonomic Mineralogy | 1 Crop Name | 4 Hardwood Tree Suitability |
| 19 Taxonomic Order | 2 Non-irrigated Crop Yield | 5 Coniferous Tree Suitability |
| 20 Taxonomic Other Family | 3 Irrigated Crop Yield | 6 Wetland Plants Suitability |
| 21 Taxonomic Particle Size | | 7 Openland Suitability |
| 22 Taxonomic Reaction | PLANT COMMUNITY | 8 Woodland suitability |
| 23 Taxonomic Soil Temp | 1 Plant Symbol | 9 Wetland Suitability |
| 24 Taxonomic Subgroup | 2 Scientific Plant Name | |
| 25 Taxonomic Suborder | 3 Common Plant Name | |
| 26 Total Subsidence* | 4 Plant Production Percent | |
| 27 Water Table Begins | | |
| 28 Water Table Depth* | | |
| 29 Water Table Ends | | |
| 30 Water Table Kind | | |

* Denotes a range of values exists

The STATSGO map unit is the smallest spatial entity that can be queried and mapped while remaining consistent with the database. Map units are comprised of up to 21 components of varying areas that contribute to the total area of the map unit. The areal/spatial composition of the map unit was derived from a statistical analysis of transects across detailed soil survey maps. The area of the map unit occupied by each component is proportional to the length of the transects containing that component. The area occupied by each component is represented as a percent of the map unit, but there is no specific location of individual components within any polygon. Thus, the percentage of each soil component area in the map unit must be used to characterize the map unit. A typical query to the database will result in an estimate of the percent of each map unit that meets the criteria.

In order to make STATSGO soils data compatible with the Arc/Info data model, the structure of the database was modified. The most significant was the inclusion of an intermediate key file and an accumulation table to replace the many-to-many relationships with one-to-many relationships. The component, layer, and interpretive tables are related to the key file by a unique component identifier composed of the map unit (MUID) and sequence number (SEQNUM). The key file contains the component percentages for each map unit. The component percentages are summed by map unit for the components that meet the criteria specified in a query statement. The accumulation table carries the MUID and the percentage of each map unit that comply with the query statements. The information located in the accumulation table is used to classify the STATSGO map units at the completion of the query. In Figure 3, a single component of map unit PA001 (34 percent) and two components of map unit PA002 (75 percent) meet the query criteria.

Figure 3. STATSGO map unit summarization



USING THE STATSGO BROWSER

The browser is an application of Arc/Info version 7.1.1 that provides menu-driven access to the STATSGO soils database compiled for the 50 states and Puerto Rico. Completing a query will produce a map displaying the percentage of each map unit that meet the specified criteria. The

user may formulate queries using data elements from any of the thirteen (13) STATSGO Browser data tables. As many as five selection statements may be generated for a single query. Options for modifying the query results include; selecting one or many states, specifying the number of classes displayed, and choosing one of six (6) alternative classification methods for displaying the results of the query. The default settings for the browser are to query the 48 conterminous states, displaying five (5) classes using a quantile classification method.

To begin the browser, the user must 1- move to the statsgo directory, 2- invoke Arc, and 3- type '&r statsgo'. The application runs in the Arcplot module. If started from the Arc prompt, the browser will enter Arcplot to begin and return to Arc when finished.

The opening screen of the browser contains an Arcplot graphics display and the STATSGO Soil Data Base - Map Unit Summary menu (summarization menu). These displays remain visible during the entire application. The **Summarization** menu has eight buttons that perform varying functions. Figure 4 summarizes each of the button's functions.

Figure 4. Browser functions

| | |
|--|---|
| <p>Build Query</p> <ul style="list-style-type: none"> Select a Query Menu Soil properties Interpretive Properties (2) Select a data element for query View data element documentation Select a data range (RV, Low, High) <ul style="list-style-type: none"> Continuous variables only Establish a processing depth <ul style="list-style-type: none"> LAYER table only Establish a compliance threshold Compose a compound interpretive query Post a query selection <p>Execute</p> <ul style="list-style-type: none"> Execute the summary <p>Delete Query</p> <ul style="list-style-type: none"> Delete individual query statements Delete all query statements <p>Documentation</p> <ul style="list-style-type: none"> Display the Data Use Guide Display the STATSGO Browser User's Guide <p>Exit</p> <ul style="list-style-type: none"> Exit the application | <p>Select States</p> <ul style="list-style-type: none"> Select individual state(s) Select a custom region Select Hawaii, Alaska, or Puerto Rico Select 48 conterminous states <p>Modify Display Classes</p> <ul style="list-style-type: none"> Select the number of display classes <ul style="list-style-type: none"> 3, 5 or 8 Select the classification scheme <ul style="list-style-type: none"> Interval, Quantile, Equal Area, Jenks Select color or gray shading Toggle water body shading <p>More Arcplot</p> <ul style="list-style-type: none"> Redraw the query results Subset the query results Create map output <ul style="list-style-type: none"> Postscript (A or B size), Metafile (gra) Display a statistical summary Save the statistical summary Save the display as a map composition Execute an ad hoc system command Execute an ad hoc arcplot command Change the map extent Clear the screen Redraw the query results for slides Save the selected set for future use |
|--|---|

Any query to the layer table constructs a soil-column average of the selected data element and then selects for those components that meet the threshold criteria. Soil-column average values are calculated using the layer thickness to weight the value for each layer. The sum of the weighted values is divided by the total column thickness to produce an average value for the column. The *Depth to:* option (layer table only) allows the user to calculate a soil-column average for a user-specified column depth.

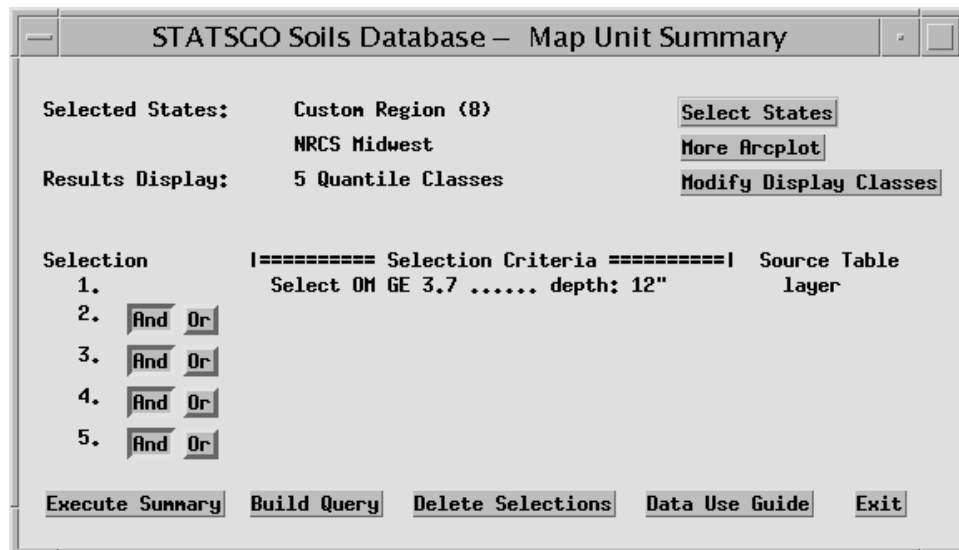
Successfully navigating the STATSGO database with this application will result in a map of the STATSGO map units of the selected states displaying percent of the map unit's soil components that have met the specified criteria. Following the execution of a query, several options are available to the user. One option is to review the results of a query by generating a statistical summary. In the **More Arcplot** menu, the *Display Statistics Summary* choice generates and displays a statistical summary of the current query results. The summary contains traditional univariate statistics and map-class area information to assist the user in evaluating the query results. This summary is linked to the map output by displaying statistical information using the same classification and shading scheme found on the map. An example of a STATSGO Map and Statistical Summary and the processing steps used to create them are found in Appendix A.

The following pages display each of the major menus used in the application, describe what function they perform, and identify any sub-menus that may be available. The sub-menus are displayed in Appendix B. The menus are described in the following order;

1. Summarization menu
2. Build Query menu
3. Delete Selections menu
4. Select States menu
5. Modify Classes menu
6. More Arcplot menu

Summarization Menu

The Summarization menu is the main menu for the STATSGO Browser. This menu displays the specified query selection criteria, the source table each query will draw from, and the type of operator associated (And/Or) with each selection. Also shown are the selected states, and the classification scheme used for displaying the results. This menu provides access to other processing actions via submenus, discussed below. In the following example, the user has established a single query that will display the percent of soil components within map units that have greater than 3.7 percent organic matter in the top 12 inches of the soil profile. The query will be confined to a custom region (NRCS Midwest) that contains eight states. The query results will be displayed in five classes using a quantile classification scheme.



DISCUSSION

- Application activities or actions are initiated from the Summarization menu. The menu provides access to the following processing menus or actions

Execute Summary - Execute the summary using specified criteria and display results

Build Query - establish a query selection and post to the Summarization menu

Delete Selections - Delete one or more query statements from the Summarization menu

Data Use Guide - View the Data Use Guide using the Adobe Acrobat Reader

Exit - Exit the STATSGO Browser

- Ancillary menus for customizing default browser parameters are accessed from the Summarization menu from the following buttons;

Select States - allows the user to choose the states selected for query. The default is the 48 conterminous states.

Modify Display Classes - allows the user to alter the classification method, number of classes displayed, and color or gray shading. The default is 5 classes, in color, using a quantile classification scheme.

More Arcplot - allows access to more Arcplot and application functions.

- The Summarization menu displays the current query environment. The query selections (1-5) and the selection criteria are displayed in the order in which they will operate. The table associated with each query is displayed to the right of the selection criteria.

- The Browser allows the user to use more than one query statement to produce the results. A query statement can reduce the set of selected map units by using the 'And' selection type or add to the selected set by using the 'Or' selection type. The 'And/Or' selection buttons are found to the left of the posted query statement strings.

Build Query Menus

These menus allow the user to construct query selection strings and post them to the **Summarization** menu for execution. There are four menus used to develop query statements; the **Select Query Menu** menu; the **Soil Properties** menu, the **Simple Interpretive Properties** menu, and the **Compound Interpretive Properties** menu. The **Select Query Menu** allows the user to select which properties menu to use. In the example below, the user has established a query to the Interpretation Table using the **Compound Interpretive Properties** menu. The results will display the percent of soil components within map units that have a Slight (RATING = '5') limitation to Road Building (GROUP CODE = '10').

The screenshot shows a window titled "Compound Interpretive Properties Menu". At the top, there is a "Summary Table:" section with five tabs: "Interpretation", "Forest", "Woodland", "Plant Community", and "Windbreak". The "Interpretation" tab is selected. Below this is a "Data Field:" section with a list box containing four items: "Interpretative Group Code", "Soil Interpret. Rating", "Rating Limitation - 1", and "Rating Limitation - 2". The "Soil Interpret. Rating" item is selected. To the right of the list box, the text "Item: RATING" and "Type: Discrete" is displayed. Below the list box, there is a "Query Type:" section with a row of buttons: "LE", "LT", "EQ", "GT", "GE", "CN", and "NC". The "EQ" button is selected. Below the query type buttons, there is a "Threshold:" section with a text box containing the value "5". At the bottom of the window, there are several buttons: "Insert Query String", "Insert 'AND'", "Reset", "Dismiss", "More Tables", "Data Dictionary", and "Post Selection". The "Query:" text area at the bottom displays the string: "GRPCODE EQ '10'" and "RATING EQ '5'".

DISCUSSION

- The push-button widget at the top of the menu selects which summarization table to use. Thirteen (13) STATSGO tables are available for use with the browser. The **Soil Properties** menu provides access to four tables; Map unit, Phase, Component, and Layer. Three tables are available from the **Simple Interpretive Properties** menu; Woodland Management, Range Production, and Wildlife Habitat. Six additional tables are available from the **Compound Interpretive Properties** menu; Forest, Interpretation, Component Yield, Woodland, Plant Community, and Windbreak. The user may toggle between the query menus by pressing the *More Tables* button and selecting the desired query menu from the **Select Query Menu** menu.
- When a summarization table is selected, data elements available from that table are displayed in a scrolling list located beneath the *Data Field* descriptor.
- Clicking on a data field selects it for use and displays the data element name and the data type (discrete or continuous) to the right of the scrolling list.

- The COMPONENT and LAYER tables have been developed with high and low values for many soil properties. An additional data element has been established in these database for a representative value (RV). The current value of the RV data elements is an average between the high and low values. Data elements that maintain this range of values are denoted with an '*' in the scrolling list. The user may choose RV, High, or Low from the push-button widget located to the right of the scrolling list.

- If the LAYER table has been selected, the user may use the *Depth to:* input field located to the right of the scrolling list. This option allows the user to specify a specific soil depth that summarize should be used when summarizing the selected data element. For example, entering a 12 in the *Depth to:* field would result in a query for the soil properties within the top 12 inches of the soil profile. The *Depth to:* field is only applicable to the LAYER table.

- The push-button widgets below the scrolling list allow for the choice of the *Query Type* (operator) to be used. Once selected, the button appears depressed. If an operator is selected that does not match the data element type (i.e. using the CN operator on a continuous data element), the user will be instructed to reformat the query. Operators include:

Continuous Variable Operators

LE - Less Than or Equal To

LT - Less than

EQ - Equal to

GT - Greater Than

GE - Greater Than or Equal To

Discrete Variable Operators

EQ - Equal to

CN - Containing

NC - Not Containing

- The threshold value for the query must be entered into the input field located next to the operator widgets. For assistance, the *Data Dictionary* button can be used to display summary information regarding the selected data element.

- The *Post Selection* button concatenates the data element, operator, and threshold values to form a query string and posts the string to the **Summarization Menu** for execution. Once a selection string is posted, the query-building menus are available for creating another query. As many as five query statements can be formulated for execution.

- When using the **Compound Interpretive Properties** menu, the user may build a complex query string that consists of multiple occurrences of 'data element, operator, and threshold values' separated with an 'AND' statement. Use the *Insert Query String* and *Insert AND* buttons to construct queries and the *Post Selection* button to post the string to the **Summarization Menu**.

- The *Reset Selection* button resets the values of the query string to null values.

- The *Dismiss* button resets the values of the query string to null values and removes the menu from the screen.

Delete Selections Menu

The **Delete Selections** menu allows the user to remove individual query selections from the Summarization menu.

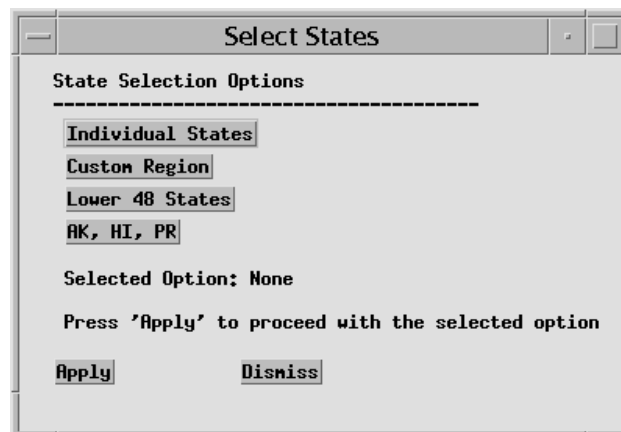


DISCUSSION

- All selections may be deleted by pushing the *Delete All* button.
- The *Dismiss* button removes the **Delete Selections** menu.
- The application will change the selection numbers correctly if a selection is deleted that changes the order of selections.
- If the user deletes Selection 1 and the following selection attempts to use a OR (add to) operator, all query statements will be removed and the user will be asked to completely reformat the queries. This action is taken to ensure that proper query logic is applied.

Select States Menu

All 50 states and Puerto Rico are available to the user for query and display. The state selection process is accessed by pushing *Select States* button found on the **Summarization** menu. Four options are available from the **Select States** menu. With the exception of the *Lower 48 States* selection, each of the options brings up a secondary selection menu with appropriate choices. These secondary menus are displayed in Appendix B.

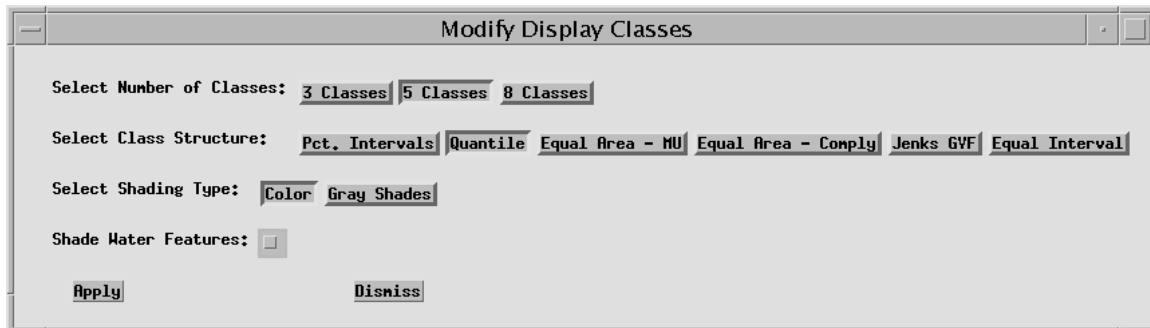


DISCUSSION

- *Individual States* - allows for the selection of individual states or groups of states selected one at a time.
- *Custom Regions* - presents a scrolling list of user-defined regions (groups of states) to choose from. The user can modify the available regions by adding-to or deleting-from the REGIONS.LIST info table located in the statsgo/work directory.
- *The Lower 48 States* - selects the conterminous United States for query
- *Alaska, Hawaii, or Puerto Rico* - allows the user to select one, and only one, of these two states or territory. These geographic frameworks are used singularly because they are spatially isolated.
- If a secondary **Select States** menu is used to choose states for a query, the user will be returned to the primary **Select States** menu where the user must *Apply* the selected option. The 'Selected Option' field will be populated with the users selected option.

Modify Display Classes Menu

This menu allows the user to change the manner in which the results of the database query are displayed. Three actions are available; changing the number of classes, changing the classification method, and choosing between a color shading or a gray-scale shading.



DISCUSSION

- Three selections are available for the number of classes to be displayed; 3, 5 or 8.
- There are six classification schemes available:

Percent Intervals - equal ranges of percent compliance with the criteria from 0 to 100 percent

Quantile - equal number of elements (map units) in each class. This is the default classification scheme.

Equal Area - Two equal-area classification schemes are available. The *Equal Area - MU* choice creates classes of approximately the same area based upon the total area of the map units that meet the criteria. The *Equal Area - Comply* choice creates classes of approximately the same area based on only the area of the map units that meet the criteria. This choice can be described as a compliance-weighted equal area classification. It may be beneficial to examine both the map output and the STATSGO Statistical Summary of several queries to fully understand the results of these class structures.

Jenks Goodness of Variance Fit (GVF) - The Jenks GVF class structure uses an iterative process that, beginning with a quantile classification, seeks to minimize the differences within classes and maximize the differences between classes. The Jenks' algorithm attempts to minimize the squared deviations about the class means and proceeds until a threshold value for improvement is reached (Robinson et al., 1985, p. 363).

Equal Interval - similar to the Percent Interval classification, except that this process uses the actual minimum and maximum values of the query results to determine the beginning and ending values of the class structure.

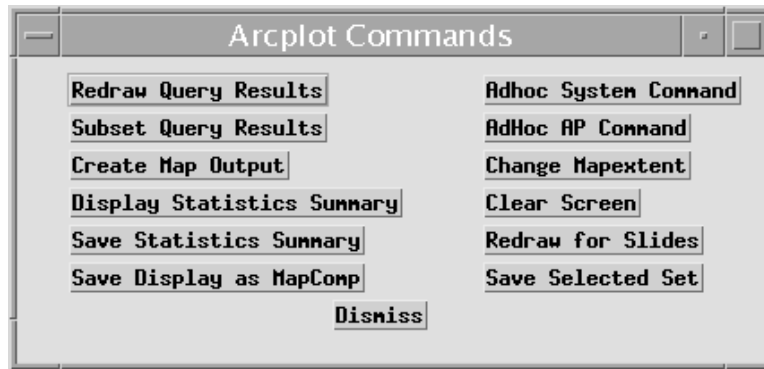
- Once the class structure has been modified, the current results displayed in the Arcplot graphic display can be updated by pushing the *Redraw Query Results* button found in the **More Arcplot** menu. This does not re-execute the query selection process, but simply updates the map composition using the new class structure.

- The colors and gray shades used to shade the map cannot be changed from the application. They may be changed by using AMLs available in the amls/support_amls directory (make_color.aml and make_gray.aml). The shade files used during the query process must be located in the statsgo/work directory.

- Checking the Shade Water Features checkbox will shade the water features for the selected states. A 'Water' class will be added to the legend.

More Arcplot Menu

The **More Arcplot** menu provides access to a suite of ancillary functions that allow for additional interaction with the Browser. These functions are described below and the menus associated with these choices are displayed in Appendix B.



DISCUSSION

- The *Redraw Query Results* choice clears the Arcplot graphics display and recreates the map display showing the query results based upon the current classification structure.
- The *Subset Query Results* choice brings up the **Subset Query** menu that allows the user to display a subset of the current query results by choosing individual classes or those map units that are within user-specified compliance values. Once a subset of classes or a compliance threshold is selected, the user must 'Apply' the choice to redraw the display. Consecutive subsetting of query results is not allowed. To return to the original set of classes, choose the 'All Classes' button on the **Subset Query** menu.
- The *Create Map Output* choice initiates a process that allows the user to create color postscript format output (A or B size) or an Arc/Info graphics meta file that can generate hard-copy output on a variety of devices. This choice brings up a menu that display pertinent information regarding production of hard-copy output and prompts the user to continue. The final output will be placed in the statsgo/output directory. Because Arc/Info's postscript option does not include a portrait/landscape parameter in the output, all postscript output will be rotated to a portrait format.
- The *Display Statistics Summary* choice initiates a process that produces an Arc/Info graphics display of traditional univariate statistics for the query results. The statistics output includes a frequency distribution graph, a cumulative distribution function graph, box plot, and a histogram of area-weighted class-specific results comparing compliant map unit area to the total map unit area. An example of the output is located in Appendix B. To create a

postscript-format version of this output choose the *Save Statistics Summary* button from the More Arcplot menu.

- Both the *Ad hoc System* and *Ad hoc Arcplot* menus bring up a window that submits commands to the appropriate operating environment.
- The *Change Mapextent* menu allows the user to change the spatial extent that will be drawn on the Arcplot graphics display. The user may choose either the default study area or an interactive selection to use the mouse.
- The *Clear Screen* choice clears the Arcplot graphics display and redraws the state boundaries at the current spatial extent.
- The *Redraw for Slides* choice performs the same action as the *Redraw Query Results* choice except using white text and line colors. This provides the opportunity to generate slide-maker compatible postscript files using the *Create Map Output* button.
- The *Save Selected Set* choice initiates a process that makes the currently selected set of map units available for post-browser processing. The results of this action is a user-named subdirectory that contains a summary list of the saved set parameters, a Arc/Info WRITESELECT file to be used with the RESELECT command to produce a coverage, a copy of the ACUUMULATE_PCT Info table, and an AML to produce the subset coverages. The post-processing AML, create_cover.aml, is copied to the save directory when the save set process is completed. When the create_cover.aml is run, an Arc/Info coverage containing the selected STATSGO polygons is create for each state that is chosen.

REFERENCES

Robinson, A. H., R. D. Sale, and J. Morrison. 1985. "Elements of Cartography", 5th ed., John Wiley and Sons. New York. 544 p.

USDA Soil Conservation Service, 1994. State Soil Geographic Database - Data Use Information. Publication Number 1492. U.S. Government Printing Office.

Appendix A. Example STATSGO Output

The following steps will result in the example STATSGO output that follows this page. The numbered steps represent choices and inputs from menus.

cd /STATSGO

arc

ARC> &r STATSGO

1. *Summarization menu*

Select States > Custom Region > 'NRCS Midwest' (Region of Interest:) > Select > Apply

2. *Summarization menu*

Modify Display Classes > Equal Area - MU > Shade Water Features > Apply

3. *Summarization menu*

Build Query > Soil Properties

4. *Soil Properties menu*

Layer > Organic Matter (Data Field:) > High (Range:) > 12 (Depth to:) > GE (Query Type:) > 4.5 (Threshold:) > Post Selection > Dismiss

5. *Summarization menu*

Execute Summary -- program completes map display

6. *Summarization menu*

More Arcplot

7. *More Arcplot menu*

Create Map Output > 8x11 Postscript > Continue

8. *More Arcplot menu*

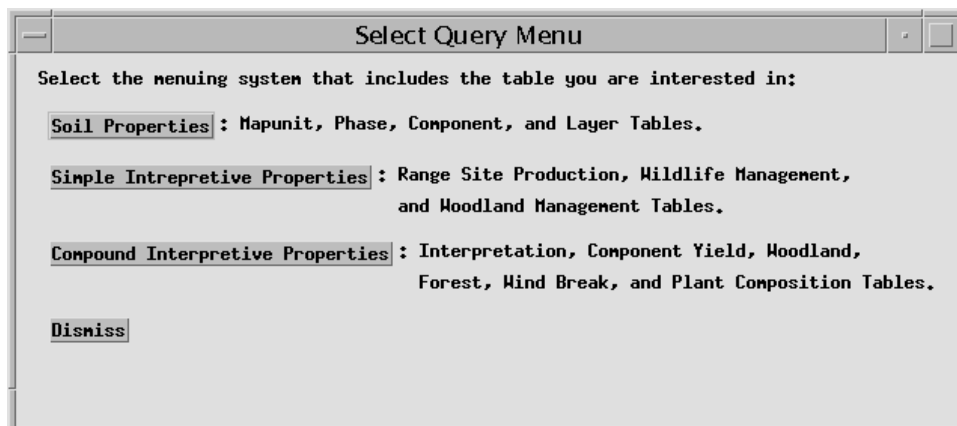
Display Statistics Summary -- <Return> in STATSGO text display window to dismiss

9. *More Arcplot menu*

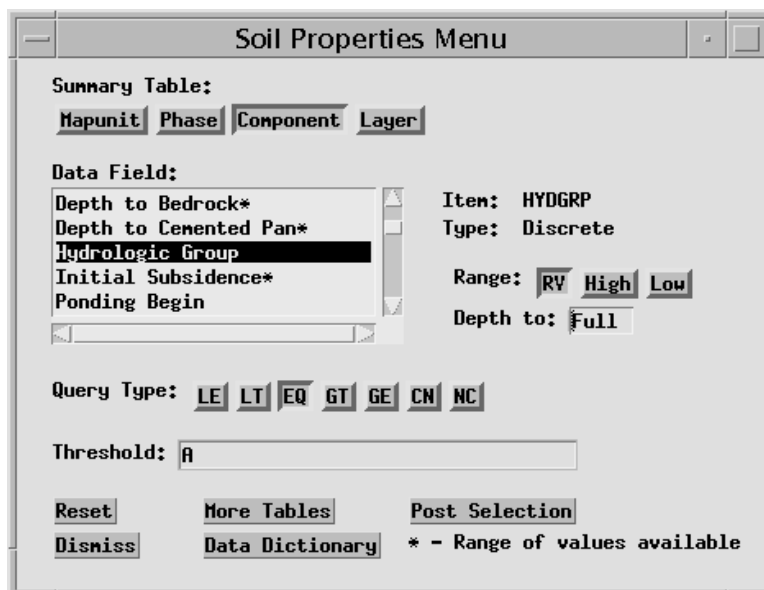
Save Statistics Summary > 'omge45' (enter name:) > Continue

Appendix B. Additional STATSGO Browser Menus

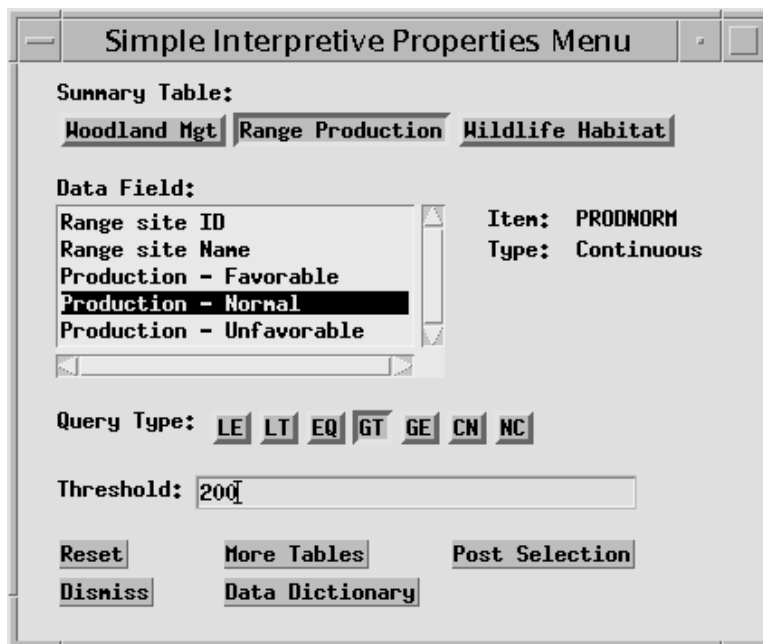
Select Query Menu menu (Build Query option)



Soil Properties menu (Build Query option)



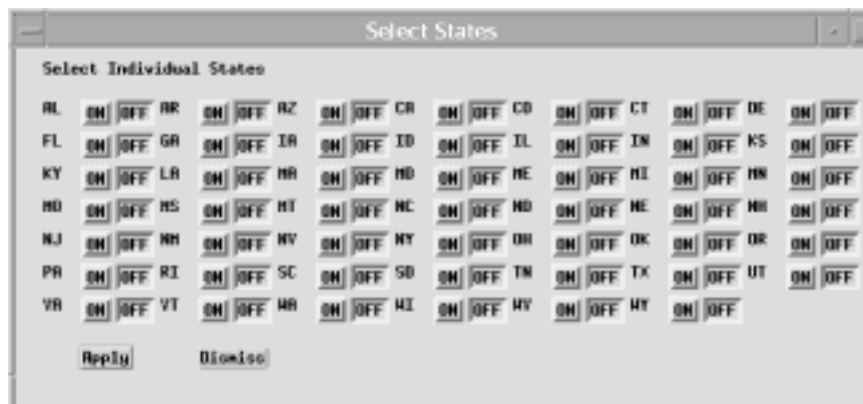
Simple Interpretive Properties menu (Build Query option)



The dialog box is titled "Simple Interpretive Properties Menu". It contains the following elements:

- Summary Table:** Three tabs labeled "Woodland Mgt", "Range Production", and "Wildlife Habitat". The "Range Production" tab is currently selected.
- Data Field:** A list box containing "Range site ID", "Range site Name", "Production - Favorable", "Production - Normal" (which is highlighted), and "Production - Unfavorable". To the right of the list box, the text "Item: PRODNORM" and "Type: Continuous" is displayed.
- Query Type:** A row of buttons labeled "LE", "LT", "EQ", "GT", "GE", "CN", and "NC". The "EQ" button is currently selected.
- Threshold:** A text input field containing the value "200".
- Buttons:** At the bottom, there are two rows of buttons: "Reset", "More Tables", "Post Selection" in the first row, and "Dismiss", "Data Dictionary" in the second row.

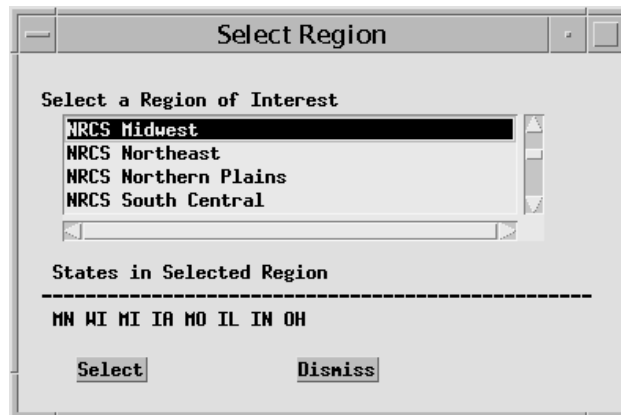
Select Individual States menu (Select States option)



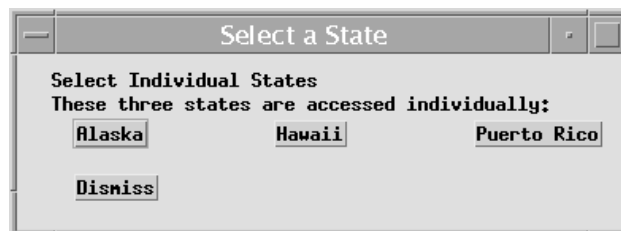
The dialog box is titled "Select States". It contains the following elements:

- Select Individual States:** A grid of state abbreviations, each followed by an "ON" and an "OFF" button. The states are arranged in 7 rows and 16 columns. The "ON" buttons are currently selected for all states.
- Buttons:** At the bottom left, there are two buttons labeled "Apply" and "Dismiss".

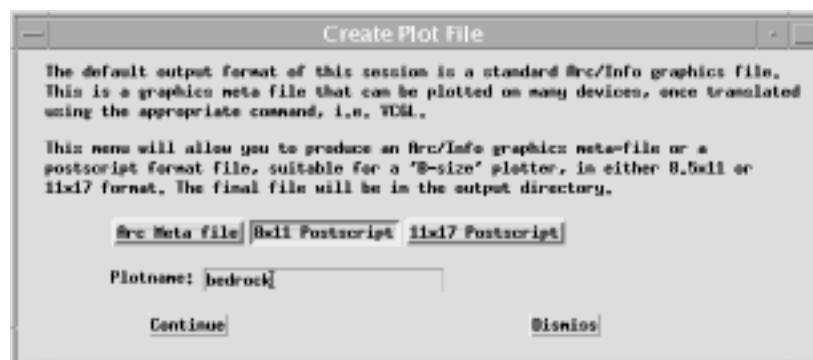
Custom Regions menu (Select States option)



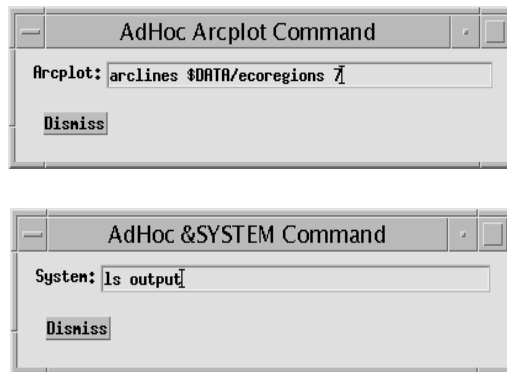
Alaska, Hawaii, Puerto Rico menu (Select States option)



Create Map Output menu (More Arcplot option)



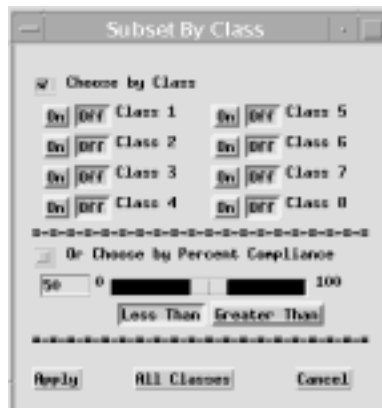
Ad hoc Arcplot and Ad hoc System menus (More Arcplot option)



Change Map Extent menu



Subset By Class menu (More Arcplot option)



STATSGO Soils

Soils-5 Data Base Summary by Map Unit

Number of States Selected: 12
Region: MB Midwest

Summarization Criteria

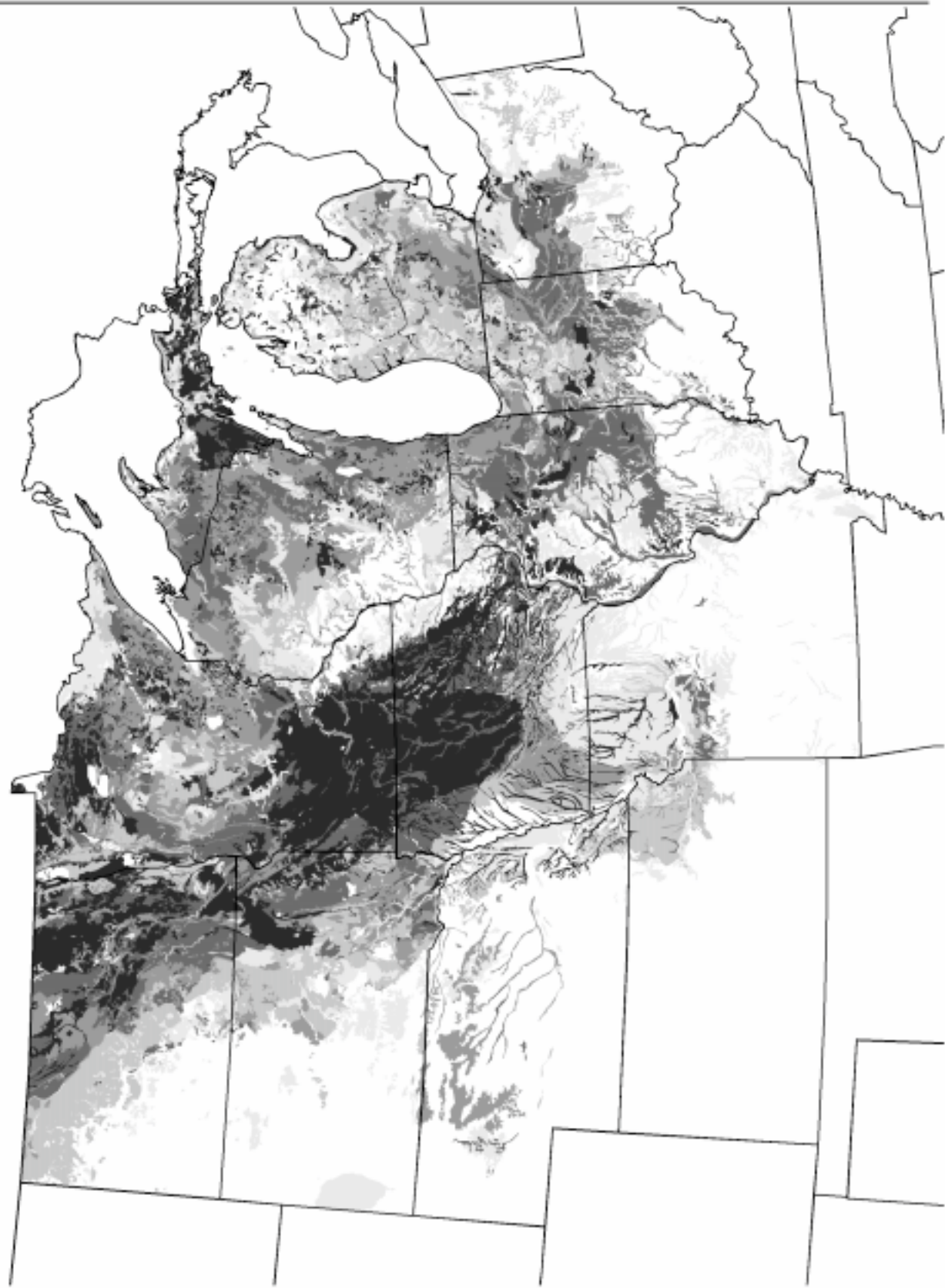
Select OM GE 5 depth: 12"

Percent of Mapunit Meeting Criteria



Class Type:
5 Equal_Area_M Classes

Approximate Scale 1:61400000



STATSGO Browser Query Summary

Summary Statistics for Percent of Mapunit Meeting Criteria

Summarization Criteria

Select OM GE 5 depth: 12*

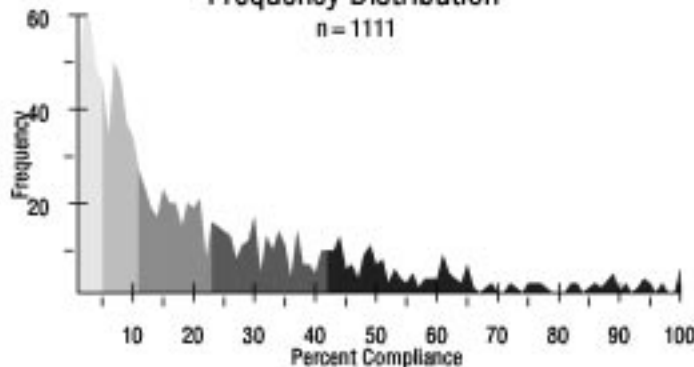
Minimum: 1
Maximum: 100
Mean: 23.3
Std. Deviation: 23.0
Inner Quartile Range: 28

5th Percentile: 2
1st Quartile: 6
Median: 15
3rd Quartile: 34
95th Percentile: 75

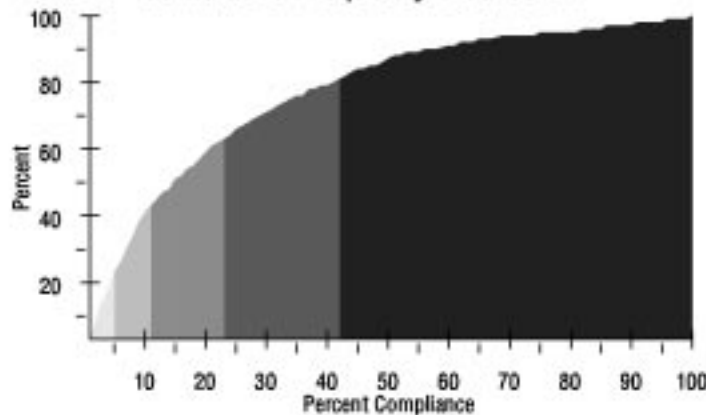
Summary by Map Unit

Frequency Distribution

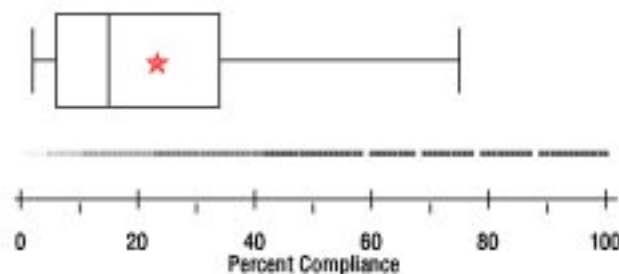
n = 1111



Cumulative Frequency Distribution



Box Plot



Summary by Map Legend Class

Legend Class Type: 5 Equal_Area_M Classes

| | Class Percent | Compliant MU Acres | Total MU Acres |
|--|---------------|--------------------|----------------|
| | 0- 5 | 1567128 | 55852597 |
| | 5- 11 | 4526028 | 53729279 |
| | 11- 23 | 9330715 | 53335161 |
| | 23- 42 | 16964100 | 51937239 |
| | 42- 100 | 31765073 | 51442695 |

Summary of Map Unit Areas by Class
Total Map Unit Acres vs Compliant Map Unit Acres

